DEFENSE INFORMATION INFRASTRUCTURE (DII)

COMMON OPERATING ENVIRONMENT(COE)

DISTRIBUTED COMPUTING ENVIRONMENT SERVER (DCES)
Segment v1.0.0.6
Installation Instructions for Solaris Operating System 2.5.1

September 30, 1997

Purpose

These instructions are for installing and configuring the Distributed Computing Environment Server (DCES) segment. These instructions provide valuable information to correctly use and configure a robust DCE cell.

References

- Transarc DCE 1.1 Release Notes for Solaris version 2.5[1]
- Transarc DCE Administration Guide: Core Components
- Transarc DCE 1.1 Command Reference
- Transarc DCE 1.1 Command Reference Supplement
- Transarc DCE Installation and Configuration Guide

What You Will Need During DCES Installation

- The root password. The Transarc **dcesetup** commands used in the installation of DCES require the root password.
- The cell administrator's password. The Transarc **dcesetup** commands and other scripts created for the purpose on installing DCES will prompt for the cell administrator's password..
- Familiarity with the COE Installer.

Machine Requirements

Total Memory: 32MB RAM (64MB RAM recommended)
Available Swap Space: 64MB

New Features in the DCE Server Segment

- The DCES installation installs the Security server the CDS server, the DTS server and the DCE client but does not configure these services unless selected from the DCE Configuration Menu.
- The Transarc DCE Patch 5 is installed during the installation process. If a higher patch is already installed, no action is taken and a warning is displayed.
- Configuration of the DCE/DFS client can be done through the DCE Server Configuration Menu.
- On-line help and guidance is available before any configuration takes place.
- Ability to view current DCE configuration.
- The CDS root directory version will be automatically upgraded to version 4.0 when configuring the first CDS in the cell.
- During DCE client configuration the **dced** is restarted with the **-x** option and the *setup_state* file is modified accordingly.

[1] Transarc DCE 1.1 Upgrade and Release Notes for Solaris Version 2.5, dated April 1996, state "Support for Solaris 2.5.1 is not included as part of this release." This is INCORRECT. Transarc DCE for Solaris 2.5 will operate normally on a Solaris 2.5.1 machine.

- Configuration of the NFS/DFS Gateway occurs more smoothly in a cell that does not contain any DFS servers.
- Recommended DII security policies can be set in the Utilities Menu.
- When registry policies are set, the *passwd_override* Extended Registry Attribute is added to the cell administrator principal to prevent him/her from being locked out of the system due to an expired password.
- An option in the Utilities Menu to populate a newly created CDS with a replica of every directory in the CDS namespace.
- An option in the utilities Menu to set a **cron** job which will purge expired DCE credentials every 8 hours.

Installation of DCES

The DCE Server segment is an aggregate which contains DCE client and DCES (the actual DCE server package) . The segments are installed one at a time. The segment installations require very little user interaction.

1. Log in as the System Administrator (sysadmin) and insert the segment tape into the tape drive.

2. Bring up the Segment Installer and use <Select Source> to select the appropriate tape drive (Exabyte, DAT, local, remote, etc) and then select <Read Source>.

3. Highlight the DCE Server Aggregate and select <Install>.

4. The COE Installer will extract the segment from the 8mm tape, this may take a few minutes.

5. A green window will display the installation of the DCE Client software.
You may be asked if you wish to continue with the installation even though the scripts are run as root.

```
This package contains scripts which will be executed with super-user
permission during the process of installing this package.

Do you want to continue with the installation of <TRDCEclnt> [y, n, ?]
```

Enter "**y**" to continue the installation. There is very little else for the user to input once the installation begins.

6. Once the software is installed, you will be asked if you wish to configure the client:

```
Do you wish to configure the DCE Client now
Press [y] for yes or [n] for no, then press [Return] (default: y)
```

Answer "**n"** and you will receive this message:

```
You can configure the DCE Client at anytime by
      selecting <NETWORK> | <DCE> from the SYSADMIN
```

```
pull-down menu.

      Press <RETURN> to EXIT
```

(You should not configure the client until the servers are configured.) Press <Return> to continue with the installation.

7. Once the DCE client segment is installed, the COEInstaller automatically installs the DCES segment. The Installer will begin extracting the DCES segment from the tape, this will take a few minutes.

8. A green window will display the installation of the DCE Client software, there is no user interaction required during the installation. After the installation is completed, the user is asked if the servers are to be configured now.

```
Do you wish to configure any DCE servers now?

Press [y] for yes or [n] for no, then press [Return] (default: y)
```

Opting to configure the servers now will send you to the configuration menu. It is possible to configure the servers at a later date. Enter n and the user will receive this mesage.

```
You can configure the DCE servers at anytime by
selcting ,NETWORK> | <DCE> from the SYSADMIN
pull-down menu.

                Press <RETURN> to EXIT
```

This will complete the installation.

Patch Upgrades

In order to apply a DCE patch, all DCE processes running on the host system must be temporarily shut down during the upgrade. This, of course, is unfeasable under certain circumstances since this may disable clients and impede operations within the cell. It is possible to install a patch and have it stored on the system until such a time as it is possible to shut down the DCE processes and upgrade the patch.

1. Install the patch using the COEInstaller, and choose not to upgrade the patch.

2. When it is possible to upgrade the patch, select Upgrade Patch (Network | DCE | Upgrade Patch) and enter the root password.

3. A COE window will appear with the following message:

```
These are the Patches currently on the system
                  P25
             The current patch level is 5
Enter the number of the patch you wish to install
```

Just enter the number of the patch that you wish to install. You will be prompted to confirm your selection.

4. You will be warned that DCE will be shut down. You will be asked to confirm that you are ready to shut down DCE to install the patch.

5. You will be informed once the patch is installed

Explanation of the DCE Server Configuration Menu:

The DCE Configuration Menu appears during the installation of DCES, but it can be accessed at any time through the **Network | DCE** menu. After installation, you should logout and log back into the machine for the changes to the sysadmin menu to take effect.

The COE will automatically install the DCE Security Server and DCE Cell Directory Server (CDS). After the installation, you will be prompted to configure the DCE servers. The DCE Configuration menu makes heavy use of Transarc's **dcesetup** command. If you feel you are sufficiently experienced with DCE, you may elect to configure the servers using the Transarc commands. If you choose not to use the DCE Configuration Menu, you should familiarize with the new features mentioned above.

```
***  DCE SERVER CONFIGURATION MENU on sulu  ***

     1) View Current DCE Configuration
     2) Configure Security Server
     3) Configure Cell Directory Server
     4) Configure Time Server
     5) Configure DCE/DFS Client
     6) Utilities and Further Configuration Options

    99) EXIT

 Please Enter Your Selection and Press <RETURN>
```

View Current DCE Configuration
This option displays all the possible DCE configurations, tests whether the component is installed, and determines which DCE components are configured and which are not. This option uses the Transarc **dcesetup info** command. The output is for the local machine only.

Configure Security Server
This option executes the **dcesetup config_secserver** command which is used configure a master or slave security server. Configuring a master security server is the first step in creating a new cell.

Configure Cell Directory Server
This option configures a CDS using the **dcesetup config_cdsserver** command. This option is used to configure an initial and/or replica CDS server. You should configure and initial CDS immediately after configuring the master security server.

If you configure the initial CDS, the root directory */.:* will be upgraded to version 4.0 as recommended in the Transarc DCE Administration Guide.

If you use this option to configure a secondary CDS server, you should immediately populate it with option 3 of the Utilities Menu, "`Populate a CDS with Read-Only Replicas.`"

Configure Time Server
This option uses the **dcesetup config_dtsserver** command to configure a DTS servers. Each cell must have at least one time server, three are recommended.

Configure DCE/DFS Client
This option allows you to configure a DCE/DFS client. This option should be selected after configuring the master security server, initial CDS, and DTS time server. In addition to using the **dcesetup config_client** command, this option restarts the **dced** daemon with the **-x** option and makes changes to the */opt/dcelocal/etc/setup_state* file. If you previously configured this machine as a time server, do not configure the machine as a DTS clerk. Doing so would negate the your previous DTS configuration. The Distributed Time Service, unlike the Security Service and Cell Directory Service, can be re-configured without having to unconfigure all the components on the machine.

Utilities and Further Configuration Options
Selecting this option takes you to the DCE Utilities Menu.

EXIT
Exit DCE Configuration Menu.

Explanation of the DCE Utilities Menu

```
***  DCE UTILITIES MENU on sulu  ***

 1) Configure NFS to DFS Gateway
 2) Set Security Registry Policies
 3) Populate a CDS with Read-Only Replicas
 4) Set CRON Job to Delete Expired DCE Credentials
 5) Unconfigure DCE/DFS

98) RETURN TO PREVIOUS MENU
99) EXIT

Please Enter Your Selection and Press <RETURN>
```

Configure NFS to DFS Gateway
This option executes a modified version of the Transarc **dcesetup config_dfsgwserver** command. This modified version first checks for the existence of the *subsys/dce/dfsgw-admin* group. If it does not exist, it is created and continues with the configuration of the NFS/DFS Gateway. The machine must be configured as a DFS client before it can be configured as a Gateway server.

Set Security Registry Policies
Selecting this option shows you the current DCE Registry Policies being used. If you chose to continue the following policies will be changed:

- Passwords cannot consist of all spaces.
- Password life-span is set to 180 days.

- Password minimum length is set to 8 characters.
- Passwords can consist of alphanumeric characters. Passwords do not have to contain special characters.
- Maximum ticket lifetime is set to 6 hours.
- The *passwd_override* extended registry attributed is added to the cell administrator's principal to prevent him/her from being locked out due to an expired password.

Populate a CDS with Read-Only Replicas
This option applies primarily to machines configured as secondary CDS servers. This option does not apply to the machine configured as the initial CDS. Continuing will populate a new clearinghouse on this machine with a read-only replica of every directory in the CDS namespace of the local cell.

Set CRON Job to Delete Expired DCE Credentials
Continuing will modify the */var/spool/cron/crontabs/root* such that the Transarc **kpurge** command will be executed every 8 hours. The **kpurge** command removes expired DCE credentials.

Unconfigure DCE/DFS
This option unconfigures all the DCE/DFS components on the machine using the **dcesetup unconfig** command.

RETURN TO PREVIOUS MENU
Selecting this option takes you back to the Main Menu.

EXIT
Exit DCE Configuration Menu.

Sample DCE Server Configuration

This is a step-by-step explanation of a sample DCE Server configuration. This example will configure a single host cell (all three servers residing on a single host). It is important to note that this is only an example. It is possible to configure a single server or any combination of servers on a single host.

1. Open the DCE Server Configuration Menu (use the Menu bar under Network | DCE)

2. Select #2 Security Server Configuration. A detailed explanation of the configuration questions is displayed. Once you page through the explanation, enter "**y**" to continue and you will be prompted for the cell name (in this case forcecom.mil):

```
Cell name: (<string>, q, ?) forcecom.mil
```

3. You will be prompted for the cell administrator's account name.

```
Cell Administrator's account name: (<string>, q, ?) [cell_admin]
```

4. You will now be prompted for the cell administrator's password

```
cell_admin's password:
Retype cell_admin's password:
```

5. You will now be asked if the host is the "Master Security Server"

```
Is this machine to be the cell's "master Security Server"? (y, n, q, ?) [n]
```

(This is the first DCE Security Server configured in the cell, so it should be designated as the master server)

6. You will now enter the lowest number for the Principal UNIX ID, lowest number for the Group UNIX ID, and the cell administrators UNIX ID (these numbers were chosen arbitrarily)

```
Low Principal UNIX ID: (<number>, q, ?) [100] 200
Low Group UNIX ID: (<number>, q, ?) [100] 200
cell_admin's UNIX ID: (<number>, q, ?) [100] 200
```

7. The Security Server will now be configured using the information that you provided. Once the configuration is complete, press <Return> to return to the DCE Configuration Menu.

8. From the DCE Configuration Menu, select #3 (Configure Cell Directory Server)

9. A detailed explanation on all of the configuration questions is displayed. Scroll through the explanation and confirm that you will continue with the Cell Directory Server Configuration.

10. You will be prompted for the cell administrator's account name and password

```
Cell Administrator's account name: (<string>, q, ?) [cell_admin]
cell_admin's password:
```

11. You will be asked if the host is the first CDS server configured in the cell

```
Is this the first CDS server to be configured in this cell? (y, n, q, ?) [n]
```

Answer "**y**" since this is the first CDS server.

12. You will now be prompted to enter the Security Server hostname

```
Security Server hostname: (<string>, q, ?) sulu
```

13. Now decide if the host will be associated with a LAN (in this case no, so answer "**n**")

```
Do you want this host to be associated with a LAN? (y, n, q, ?) [n]
```

14. The Cell Directory Server will now be configured using the information provided. When the configuration is complete, press <Return> to return to the DCE Server Configuration Menu.

15. From the DCE Server Configuration Menu, select #4 (Configure Time Server), another explanation of the configuration questions will be displayed. Read through the explanations and confirm that you will continue the Time Server configuration.

16. You will be prompted for the cell administrator's account name and password.

```
Cell Administrator's account name: (<string>, q, ?) [cell_admi n]
cell_admin's password:
```

17. Now you will choose the type of DTS server configuration (local or global)

```
Type of DTS server configuration (local or global): (<string>, q, ?) [local]
```

In this case accept the "**local**" DTS server configuration

18. Now you will decide if there will be any further DTS server configuration for this host.

```
Further DTS server configuration for this machine (none, courier,
backupcourier, or timeprovider): (<string>, q, ?) [none]
```

Accept "**none**".

19. The Time Server will now be configured using the information provided. Once the configuration is complete, press <Return> to return to the DCE Server Configuration Menu.

20. From the DCE Server Configuration Menu, choose #5 (Configure DCE/DFS Client). An explanation of the configuration questions is displayed. Read through the explanations, and confirm that you wish to continue the client.

21. Enter the cell administrator's account name and password.

```
Cell Administrator's account name: (<string>, q, ?) [cell_admin]
cell_admin's password:
```

22. Enter the Security Server's hostname ("sulu"in this case)

```
Security Server hostname: (<string>, q, ?) sulu
```

23. Enter the CDS Server's hostname ("**sulu**" in this case)

```
CDS Server hostname: (<string>, q, ?) sulu
```

24. Decide now if the host is to be associated with a LAN

```
Do you want this host to be associated with a LAN? (y, n, q, ?) [n]
```

Answer "**n**"

25. Decide if the host is to be a DFS client (select this only if you have a DFS server running within the cell, otherwise answer "**n**")

```
Do you want to configure this machine as a DFS client? (y, n, q, ?) [y] n
```

26. Decide if the host is to be configured as a DTS clerk (if you previously configured the host as a Time Server, answer "**n**", do not configure the host as DTS clerk. If you do, it will nullify the previous configuration)

```
Do you want to configure this machine as a DTS clerk? (y, n, q, ?) [y] n
```

27. The DCE Client will now be configured using the information provided. Once the configuration is complete, press <Return> to return to the DCE Server Configuration Menu and complete the DCE Server configuration.

28. It is possible to confirm the current DCE configuration at any time from the DCE Server Configuration Menu by selecting #1 (View Current DCE Configuration).

29. When you are satisfied with the host's configuration, enter #99 (EXIT)

Useful Commands to Validate DCE Configuration

dce.ps

Perhaps the most useful Transarc DCE command which lists all DCE and DFS daemons running on a machine. Below is our sample output followed by an explanation of which daemons to look for.

```
% dce.ps
DCE daemons
F S   UID   PID PPID C PRI NI     ADDR    SZ    WCHAN TTY TIME COMD
8 S     0  1371    1 0  40 20 f5edccd0  1969 f5edd2d8 ?   5:21 dced
8 S     0  4063    1 0  40 10 f5ebf988  1971 ee220ea4 ?   1:55 secd Sec Server
8 S     0  4151    1 0  40 20 f64d3330  2107 f64fb626 ?   4:17 cdsd CDS Server
8 S     0   984    1 0  39 20 f5edc670  1785 f5f47f26 ?   0:05 cdsadv
8 S     0  4204    1 0  40 20 f64d2cd0  1910 f64d32d8 ?   2:32 gdad
8 S     0  5637    1 0  40 20 f6641998  1680 f6641fa0 ?   0:34 dtsd DTS

NOT_RUNNING: secd pwd_strengthd cdsd gdad dts_ dtstimed auditd nsid

DFS daemons
F S UID PID PID PRI NI     ADDR    SZ   WCHAN TTY TIME COMD
(output not shown)


License daemons
```

```
F S   UID   PID  PPID  C PRI NI     ADDR     SZ    WCHAN TTY      TIME COMD
(output not shown)
```

The dce_login command

The **dce_login** command validates a principal's identity and obtains the principal's network credentials.

```
# dce_login cell_admin
Enter Password:
```

The kinfo command

After logging into DCE, the **kinfo** command can be used to verify your DCE identity.

```
# kinfo
Identity Expiration: Mon Nov 25 16:12:52 1996

Realm:          /.../gccs.smil.mil
Identity:       cell_admin
Primary Group:  none

Groups:         none
                acct-admin
                subsys/dce/sec-admin
                subsys/dce/cds-admin
                subsys/dce/dts-admin
                subsys/dce/audit-admin
                subsys/dce/dced-admin
                subsys/dce/dfs-admin      (Cells with DFS configured only.)
                subsys/dce/dfsgw-admin    (Cells with DFS configured only.)
```

The dcecp dts show command

The following command was executed on a DTS client machine. It provides valuable information, such as when the last time the client synchronized, `last time polled`, with a DTS server.

```
# dcecp -c dts show
{tolerance +0-00:05:00.000I-----}
{tdf -0-05:00:00.000I-----}
{maxinaccuracy +0-00:00:00.100I-----}
{minservers 1}
{queryattempts 3}
{localtimeout +0-00:00:05.000I-----}
{globaltimeout +0-00:00:15.000I-----}
{syncinterval +0-00:10:00.000I-----}
{type clerk}
{clockadjrate 10000000 nsec/sec}
{maxdriftrate 1000000 nsec/sec}
{clockresolution 10000000 nsec}
{version V1.0.1}
{timerep V1.0.0}
{autotdfchange no}
{nexttdfchange 1997-04-06-03:00:00.000-04:00I0.000}
{status enabled}
```

```
{localservers
 {name /.../gccs.smil.mil/hosts/spock/self}
 {timelastpolled 1996-11-25-10:06:27.587-05:00I-----}
 {lastobstime 1996-11-25-10:06:27.492-05:00I-----}
 {lastobsskew +0-00:00:00.095I-----}
 {inlastsync TRUE}
 {transport RPC}}
```

The dcecp cell ping command

The **cell ping** command performs a quick check to test if the cell is running. If no options are given the command pings the master security server, any CDS servers that house a master directory replica and all DTS servers.

```
# dcecp -c cell ping
DCE services available
```

The **-replicas** option will cause the command to ping each security and CDS server, both master and replica, as well as all DTS servers.

```
# dcecp -c cell ping -replicas
DCE servers available
```

The **-clients** option will cause the command to ping every machine in the cell.

```
# dcecp -c cell ping -clients
DCE clients available
```

The cell show command

The **cell show** command returns attributes describing the configuration of the specified cell. In the following example, we have two machines in the cell. *Spock* is the master security server, a CDS server and DTS server. *Sulu* is a replica security server and a CDS server.

```
# dcecp -c cell show
{secservers
 /.../gccs.smil.mil/subsys/dce/sec/sulu_slave
 /.../gccs.smil.mil/subsys/dce/sec/master}
{cdsservers
 /.../gccs.smil.mil/hosts/spock
 /.../gccs.smil.mil/hosts/sulu}
{dtsservers
 /.../gccs.smil.mil/hosts/spock
 /.../gccs.smil.mil/hosts/sulu}
{hosts
 /.../gccs.smil.mil/hosts/spock
 /.../gccs.smil.mil/hosts/sulu}
```

The fact that *sulu* is listed under dtsservers is incorrect and misleading. The **cell show** command should not be used determine the DTS servers in a cell. Use **dts catalog** to determine which machines in the cell are DTS servers.

```
# dcecp -c dts cat
/.../gccs.smil.mil/hosts/spock/dts-entity
```

The cdsrepl lsreplicas command

This command lists replication information about directories in the CDS namespace. The **-r** option stands for recursive. Recall, our cell has two CDS servers, *spock* and *sulu*. Also this command was executed after selecting option 3 of the Utilities Menu, "Populate a CDS with Read-Only Replicas." The **lsreplicas** command displays useful information about where directory replicas are stored and when they were last updated.

```
# cdsrepl lsreplicas /.:/ -r
/.../gccs.smil.mil:
Convergence: medium
Last Successful Skulk:  Nov 25 09:28
Last Attempted Skulk:   Nov 25 09:28
Last Update:            Nov 25 09:28

Replicas:
        /.../gccs.smil.mil/spock_ch (master)
        /.../gccs.smil.mil/sulu_ch (read only)

/.../gccs.smil.mil/hosts:
Convergence: medium
Last Successful Skulk:  Nov 24 23:28
Last Attempted Skulk:   Nov 24 23:28
Last Update:            Nov 25 08:28

Replicas:
        /.../gccs.smil.mil/spock_ch (master)
        /.../gccs.smil.mil/sulu_ch (read only)

/.../gccs.smil.mil/hosts/spock:
Convergence: medium
Last Successful Skulk:  Nov 24 23:28
Last Attempted Skulk:   Nov 24 23:28
Last Update:            Nov 25 08:28

Replicas:
        /.../gccs.smil.mil/spock_ch (master)
        /.../gccs.smil.mil/sulu_ch (read only)

/.../gccs.smil.mil/hosts/sulu:
Convergence: medium
Last Successful Skulk:  Nov 24 23:28
Last Attempted Skulk:   Nov 24 23:28
Last Update:            Nov 25 08:28

Replicas:
        /.../gccs.smil.mil/spock_ch (master)
        /.../gccs.smil.mil/sulu_ch (read only)

/.../gccs.smil.mil/subsys:
Convergence: medium
Last Successful Skulk:  Nov 25 10:28
Last Attempted Skulk:   Nov 25 10:28
--More--
```

```
Last Successful Skulk:  Nov 25 10:28
Last Attempted Skulk:   Nov 25 10:28
Last Update:            Nov 25 08:28
```

(Further output omitted.)

De-Installation of DCES

The DCE Server Aggregate segment cannot be de-installed using the COE Segment Installer. To de-install the DCE Server segment, login as root and do the following steps.

1. Unconfigure all DCE components on the machine using the command:

```
/etc/dcesetup unconfig -force
```

You may be instructed to issue this command twice depending on whether or not the machine is also a DFS client.

2. Use the **dcesetup** command to "**uninstall**" the DCE Client software with the command:

```
/etc/dcesetup uninstall
```

You will be asked if you wish to remove everything

```
Uninstall all (remove everything)? (y, n, q, ?) [n]
```

Answer "**y**" and the **dcesetup** script will remove all of the client software.

3. Remove the DCE Server directories under the /h partition using:

```
/usr/bin/rm -r /h/COTS/DCE_client
/usr/bin/rm -r /h/COTS/DCES
/usr/bin/rm -r /h/DCE_server
```

4. Use the following commands to remove files from the /etc directory

```
/usr/bin/rm /etc/audit_config.dii
/usr/bin/rm /etc/dce_config.dii
/usr/bin/rm /etc/dce_unconfig.dii
/usr/bin/rm /etc/dtsserver_config.dii
```

5. Finally, to remove the DCES menu item from the sysadmin menubar. Using the **vi** editor, remove the following lines from the **/h/USERS/local/Profiles/SA_Default/Menus/SA_Default.main** file:

```
#------------------
# DCE Menu Items
#------------------
PDMENU  :Network        :1:R1
PRMENU  :DCE            :1:R1
PDMENUEND :

CASCADE :DCE
ITEM    :Configure DCE Client:xterm -title "DCE Setup Screen" -e
/h/COTS/DCE_client/bin/SARunDCEConfig -c_config:1:1:1:R1
ITEM    :Configure DTS server:xterm -title "DCE Setup Screen" -e
/h/COTS/DCE_client/bin/SARunDCEConfig -d_config:1:1:1:R1
ITEM    :Configure Audit server:xterm -title "DCE Setup Screen" -e
/h/COTS/DCE_client/bin/SARunDCEConfig -a_config:1:1:1:R1
ITEM    :Unconfigure DCE :xterm -title "DCE Setup Screen" -e
/h/COTS/DCE_client/bin/SARunDCEConfig -unconfig:1:1:1:R1
ITEM    :Upgrade Patch   :/h/COTS/DCE_client/bin/upgrade:1:1:1:R1
CASCADEEND      :
```

Logging out and back into the environment will update the <NETWORK> | <DCE> menu.